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PERITYPHLITIS IN THE YOUNG.

THOUGH this disease has been much written about and much discussed within the last few years, it continues to be a subject of absorbing interest, both because of the frequency of its occurrence in the young, and because of the difficulties involved in the solution of technical questions relating to its management.

Every physician has at some time been confronted with the problem, whether he should rely solely upon medical treatment in these cases or whether he should assume the responsibility of operative interference. If the case die without operation, he is prone to reproach himself with the reflection, "the patient might have been rescued if he had been operated upon." If, on the other hand, the patient recover spontaneously, elated the physician will exclaim, "I am glad that an operation was not performed."

These thoughts portray vividly the uncertainty which may surround our conclusions in these cases, and will warrant a discussion both profitable and instructive. According to its anatomical seat or pathological state the disease may be designated typhlitis, perityphlitis, paratyphlitis, and appendicitis. But inasmuch as it is not always possible to readily differentiate these varieties, the generic term perityphlitis is to be commended for ordinary description.

Perityphlitis occurs more frequently than is generally supposed, for many cases are so mild in character that they do not require treatment. It has been estimated that one-third of all necropsies reveal lesions which indicate that the subject had been the victim of an appendicitis at some remote period, although no history of its occurrence had been elicited during life. It is met with twice as often in males as in females.



Among children perityphlitis is a common affection. In boys the disease is apt to be less severe than in men, and with a tendency to improvement in all the symptoms. Dr. R. H. Fitz, of Boston, in a careful analysis of four hundred and sixty-four cases of the various forms of iliac regional disease, found that fifty per cent. of them were under twenty years of age.*

In very young children the disease is rare. The youngest case on record occurred in an infant seven weeks old, which was reported by Dr. Demne. The duration of the attack is not constant. In children it is usually shorter than in adult life. In its clinical course the disease may be either resolving or suppurative. If the attack is to end in resolution, it will in the majority of instances continue from fourteen to twenty-one days. If, on the other hand, suppuration shall have supervened, an early operation naturally will shorten the attack. Furthermore, in such cases which seem to have resolved and to have apparently recovered, adhesions resulting from former inflammatory attacks, or encapsulated abscess, or fæcal matter temporarily confined in a segment of the bowel by adhesive inflammation, may be among the causes of a revival of the disease in consequence of some accident or some indiscretion of the patient. These recurrent attacks may prolong the duration of the illness beyond the limit of time ordinarily reached in the resolution of a primary attack. The late Willard Parker observed that while the formation of abscess was of more frequent occurrence in the adult, perforation and gangrene of the appendix were more commonly encountered in children. Sometimes when pus has formed it will make its way out through the abdominal walls. Dr. Bull, of New York City, has reported sixty-seven cases of abscess, of which twenty-eight burst through the abdominal parietes, and only eight into the peritoneal cavity.

The anatomical structure of the cæcum and appendix, as it obtains in children, readily predisposes these organs to inflammation. Congenital or acquired irregularities in position and attachment of the appendix may favor attacks of inflamma-

* Amer. Jour. Med. Sciences, 1887.

tion. The narrow lumen of the colon and the tortuous character of the appendix render the latter especially liable to become the seat of inflammatory action. For while in the adult the ratio of the diameter of the colon to that of the appendicular process is as eight to one, in the new-born infant this ratio is only as four to one. The entrance of foreign substances into the vermiform process is also encouraged by this anatomical relationship. The greater irritability and proneness to inflammation of the intestinal tract in the young is another factor to be considered in the causation of the disease and of its frequency in early life. In children, as in adults, the same general causes, exclusive of abdominal tumors, will produce an attack of the disease. Among these may be enumerated external violence, as falls, blows, efforts at lifting heavy weights, and so on. These usually act as exciting causes, for some internal condition is nearly always the predisposing cause. Most frequently, however, the attack depends upon internal causes alone. Among these are constipation and the presence of indigestible food or other foreign bodies. The irritation arising from the presence of lumbricoid worms has sufficed to bring on an attack. Reflex causes, like cold, have been assigned as the origins of an attack. And by some physicians the strumous diathesis even has been assumed to act as a predisposing cause.

Pathologically, the lesions in children are similar to those in the adult. The inflammation may have its starting-point in either the cæcum or the appendix, or in both. Thence it may extend to the peritoneum, or to the peritoneum and cellular tissue of the iliac fossa, constituting a complicated process of disease to which we have applied the generic term perityphlitis. In the majority of these cases it is more than probable that the peritonitis is secondary. Most cases take their origin in the vermiform appendix. Post-mortem examinations have disclosed the fact that the walls of the cæcum and the post-cæcal cellular tissue are in but few instances the seat of decided inflammation, and that then it is a result of the presence of impacted fæces or foreign bodies. Osler,* how-

* Medical News, 1887.

ever, has observed perforation from round ulcer as well as other lesions in the cæcum. Abscess may form in the right iliac fossa, in the right lumbar region behind the cæcum, or in the pelvis. At times, when the acute symptoms have subsided, hard faecal matter, intestinal concretions, gall stones, or other foreign substances, may be discharged from the body. In such cases it must be assumed that typhlitis or perityphlitis has occurred, the hypothesis that ulceration and perforation of the appendix have occurred being untenable. Although pathological confirmation is lacking to this assumption it is generally adopted, because no more plausible explanation has been offered.

It does not admit of doubt that the most common cause of perforation and ulceration is the presence of an enterolith or other foreign matter. In a number of cases, however, in which no foreign body could be discovered, it was evident that a simple catarrhal inflammation had advanced to ulceration and perforation. What the lesion may have been in cases which end in resolution and restoration to health is a matter for conjecture. In quite a number of such cases it might be fair to assume that the cæcum has been the seat of a simple inflammation, the resulting effusion forming the tumor which easily submits to the process of resolution. Numerous cases of this description have been reported. In fatal cases of appendicitis pus is undoubtedly present, with ulceration and perforation. Great importance attaches to the location of the deposits of pus in these cases. The collections of pus are frequently intraperitoneal, imprisoned in circumscribed sacs of peritoneal tissue produced by adhesion of adjacent loops of the intestines. Osler has said that a circumscribed peritonitis, moderate in degree, lasting for weeks or months, may follow a perforation of the appendix. This localized peritonitis of mild intensity may suddenly be converted into an acute peritonitis by the bursting of the small restricted abscess into the general peritoneal cavity.

In children a prodromal stage, lasting weeks or even months, often exists before a conclusive diagnosis can be established. Though diarrhoea is sometimes present, generally the patient is troubled with constipation before and during the illness.

Vomiting is often a prominent symptom. Recurrent pains and localized tenderness over the region of the cæcum are the most constant and reliable symptoms. Yet pain is not uniformly present in the right iliac region, for it has been complained of in the epigastrium and even in the left iliac fossa. Pain is also sometimes felt along the course of the transverse colon. Walking and standing are interfered with. The right side is apt to be favored by the patient. The right leg tingles and is painful. At times that extremity is bereft even of its physical powers. The dorsal decubitus, with flexion of the right thigh, is the usual posture of the sufferer. The general febrile symptoms of inflammation are of course present. If within a few days the patient's temperature should become normal and the local symptoms improve, the attack will probably end in resolution. If, on the contrary, the fever should continue, accompanied by an aggravation of the local symptoms, emaciation, feebleness, rigors, colliquative sweats, and profound anæmia, suppuration is undoubtedly proceeding. A point to be recollected, however, is that occasionally the formation of pus may take place with the absence of high temperature, and minus other *appreciable* clinical signs of the suppurative process.

Parotitis has been met with as a complication of perityphlitis. Local thrombosis and phlebitis, also phlebitis of the portal vein and its radicles with embolic hepatitis, have been encountered as complications of the disease. In several cases of perforated appendix pain in the genitals has been noted.

A history of prolonged constipation, with the development of febrile movement, protracted pain, and a tumor located in the lumbar region, which has a boggy feeling when pressed upon, denote the presence of a faecal typhlitis. Acute intestinal obstruction is characterized by constipation, the early appearance of meteorism, the retention of flatus, and the late appearance of fever. Peripheral pain along the right lower extremity is apt to be misleading, for this disease sometimes stimulates coxitis. Dr. V. P. Gibney has observed eight or ten cases of perityphlitis in children who exhibited the characteristic deformity of hip-joint disease. Typhoid fever is to be

differentiated by its clinical history and the absence of rigidity and tumefaction in the ileo-cæcal region. Intussusception should be discriminated from this disease by its bloody discharges and pronounced tenesmus. Impaction of fæces can be diagnosticated by a history of previous constipation, and by the presence along the course of the colon of an oblong swelling, with but slight tenderness and of a doughy consistency. In female children an oöphoritis as a sequela to gonorrhœal infection may be confounded with a perityphlitis. A physical examination of the girl and the presence of the usual vaginal discharge will enable the physician to make the correct diagnosis in such cases. The disease is also to be differentiated from a simple, deep-seated, mural abscess occurring in the right iliac region, an example of which came under my observation within the last year. In these cases the physical signs of the various affections must be kept clearly in mind by the physician, for upon a proper construction of their significance must depend his diagnosis. Therefore abdominal pain more or less intense, tenderness on pressure about two inches from the anterior superior spinous process of the crest of the right ilium in a line between it and the navel, fever of a higher or lower degree, rigidity of the abdominal muscles, tympanites of varying amount, a tumor of greater or less size, and pain when the right thigh is extended, present to us a graphic clinical picture indicative of the presence of perityphlitis.

Although this combination of symptoms will render the diagnosis of the disease quite easy, the solution of the questions as to what stage the disease may have reached, as to whether pus has formed or not, as to whether perforation has happened or not, or even as to whether a general peritonitis may be present or not, will always be surrounded with difficulty. Suppurative perityphlitis may be concomitant with either a spreading or a limited peritonitis. Both of these forms of peritonitis begin with the same complex of symptoms, and it is not feasible to discriminate between them for the first twenty-four to seventy-two hours. The presence of any of the local signs of a general peritonitis will of course justify the diagnosis of a progressive peritonitis. Absence of such symptoms or their strict delimitation to the right iliac fossa will

indicate a circumscribed peritonitis. In perforative circumscribed peritonitis a tumor will show itself in from two to five days. The difficulties of diagnosis are increased in these cases, because even when a higher grade of inflammation exists from perforation, there is sometimes no local pain over the seat of the lesion. The temperature record, too, in cases of perforation, is often fallacious, for it is not of infrequent occurrence among such cases to find the temperature subnormal. I can recall at least one case illustrative of this observation. In this case ulceration of a colloid cancer of the cæcum terminated in perforation of that organ. No clinical evidence of a peritonitis could be obtained, but when the autopsy was performed sixty-four hours after the probable time of perforation and sixteen hours after death, the characteristic appearances of a peritonitis of many hours' duration stood revealed. Again, the classical signs of suppuration cannot always be observed. There is at times a marked disproportion between the symptoms indicative of suppuration and the actual operation of that process in the person of the patient. I have seen at least two patients in whom pus had formed who lacked the usual symptoms of suppuration.

The relative anatomical position of the cæcum and appendix with their peritoneal attachments is favorable to the appearance of the tumefaction in the right iliac fossa, when the former organ happens to be the seat of the lesion. Hence, when the swelling is not evident by palpation in this region, and the lesion is then suspected to be located in the appendix, it is very important to examine per rectum. Dr. Wm. Pepper, of Philadelphia, lays great stress upon the necessity of making such examination early in the history of the case, in order to determine the existence of inflammatory swelling and pus. In the differential diagnosis between retroperitoneal and intraperitoneal abscess, and between appendicitis and perityphlitis, many difficulties are involved. A sudden outburst of the symptoms of a localized peritonitis points decidedly to the occurrence of a perforation of the appendix. Inflammation of the cæcum and the cellular tissue behind it is *slower* in development.

General peritonitis resulting from a perforation of the ap-

pendix differs from a general peritonitis resulting from perforation elsewhere in this, that, in the first instance, the pain and tenderness begin in the right iliac fossa, that the inflammation is of more gradual extension, and that collapse is slower in its course. In order to determine whether pus be present, aspiration has been resorted to. Dr. McBurney does not look with favor upon the use of the exploring syringe, and in the beginning of the illness he unqualifiedly condemns its use, in which, doubtless, we all coincide. But it must be conceded that the risks are diminished if the procedure be reserved for cases in which the symptoms have lasted several days, and in which a distinct indurated tumefaction can be defined. In one of my cases in which it was doubtful whether pus were present, inasmuch as the signs of suppuration were absent, aspiration was resorted to, and revealed its presence. The aspirating needle should be inserted obliquely, for when it is done so, the contents of the tumor are less apt to escape into the free peritoneal cavity and light up a general peritonitis. Dr. W. Gill Wylie, in a discussion on this subject at a meeting of the Northwestern Medical and Surgical Society of New York City, alluded to a number of cases occurring in Bellevue Hospital, in which such a catastrophe resulted from inserting the aspiratory needle in a vertical direction. We have also been warned of the risk involved in the insertion of the exploratory needle into an inflamed and ulcerated cæcum, lest a suppuration be induced thereby, which otherwise might not have developed. This, I imagine, is not so very likely to occur.

Not so very long ago, the rate of mortality of this disease among the young was estimated to be as high as seventy per cent., and that forty-four per cent. died within the first seventy-two hours. Greater precision in diagnosis and a more rational management of the disease have enabled us to greatly reduce this high rate of mortality. Ordinarily, when the disease is restricted to the cæcum and its surrounding tissue, the attack under the approved medical treatment will most likely be conquered. But unless care be exercised until all tenderness about the affected region shall have positively disappeared, relapses may be looked for. Dr. McBurney denies that the symptoms of the disease are in direct ratio to the

gravity of the disease in a given case, and therefore deprecates the advice given by some writers to depend upon such relationship. It has been aptly said by Dr. Fagge, "that the course of the disease depends very largely upon the plan of treatment which may be adopted, for when the case is skillfully treated recovery may be anticipated." Though this be so, we must yet be guarded in our prognostications, for complications may unexpectedly arise at any moment to vitiate the promising outlook.

As regards treatment, the cognate affections—typhlitis, perityphlitis, paratyphlitis, and appendicitis—may all be considered as varieties of a localized peritonitis originating in the neighborhood of the cæcum. Therapeutically considered, we may follow Treves in his division as follows: First, there is the mild form, which is amenable to simple medical treatment, and usually ends in resolution. Secondly, a form which ends in suppuration nearly always depending upon some trouble originating in the appendix, and in which a prompt and definite surgical interference is indicated. Thirdly, the relapsing type of appendicitis, in which operation should be done only after the inflammatory symptoms have subsided.

In the treatment great efforts should be made to secure if possible a termination of the attack in resolution. Absolute rest should always be enjoined in the treatment of a case of this disease. In the young, particularly in those instances in which colicky and obscure pains are experienced at varying intervals, the least tenderness and pain in the right iliac region should be viewed with suspicion, and should prompt us to enforce the principle of treatment just mentioned in conjunction with a proper kind of diet. For in these insidious cases among children, perforation has been known to result after the administration of a laxative, or the use of enemata.

A very important thing in the dietetic regimen is the undesirability of letting milk form the staple article of diet in these cases. The milk is to be discarded or at least curtailed, because the hard curds formed by the coagulation of the caseine will act as irritants to the inflamed tissues. Hence meat juices and extracts, beef-tea, chicken, veal, and mutton broths, are to be preferred in the nourishment of the patient.

Unusual obesity of the patient rather dictates an expectant mode of treatment. Usually the patient has taken a cathartic before the physician is summoned. If not, a mild laxative may be administered in the beginning of the attack. Later cathartics and enemata must be withheld. To relieve the pain opium and its alkaloids, morphine or codeine, which latter is preferred by many, should be prescribed. Local depletion, counter-irritation, and warm fomentations are employed at the same time. In young children, Silberman prefers the use of chloral hydrate to that of opium. In a case of simple typhlitis due to fæcal retention, saline cathartics in moderate doses with an ample quantity of water will be serviceable. The employment of leeches in the management of these cases has received considerable attention. It has been recommended to apply from four to eight of them where the pain is most prominent. Sinapisms, tincture of iodine, and blisters have been used as counter-irritants, particularly if the tumor appears slowly.

In reference to the use of cold or warm local applications no uniformity of opinion seems to prevail. The broad statement has even been made that the feelings of the patient should decide which should be employed. Though *a priori* cold would seem to be indicated, I prefer the warm applications. My reason is, that the warm fomentations would encourage the production of a plastic circumscribed peritonitis, so that in case pus should form it would become encapsulated, so to speak, shut off from the general peritoneal cavity, and less liable to burst into it. Cold, though it may be grateful to the patient, will hinder this process. For the support of the flexed thighs a pillow should be placed under the knees. In persistent vomiting, rectal feeding and stimulation may be employed. As local sorbefacients, belladonna, mercury, and iodide of potassium ointments have been suggested. I omitted to mention that one drawback to the use of warm poultices locally is the production by their use of a superficial œdema, which may obscure the local evidence, and thus interfere with the accuracy of diagnosis. To relieve the uncomfortable feeling of distention when excessive tympanites is present, rectal bougies should be used to lead it off. Puncture of the intes-

tines to relieve this condition must be condemned in these cases as perilous on account of the paralyzed state of the intestinal walls.

Inasmuch as many patients who exhibit all the typical symptoms of the disease recover without resort to surgical measures, it must be acknowledged that as yet we have no unvarying rule to guide us in determining which cases do and which cases do not need operation. If after the first three or four days no abscess can be discovered by physical exploration, surgical interference is not to be thought of. If, however, the patient is growing daily worse, and there be evidence of pus after the third day, an exploratory operation should be performed before the end of the first week, or as soon as the symptoms demand it. If pus be found, the operation should be carried on to its conclusion. In doubtful cases the risk of an exploratory operation is less than the risk involved in the evolution of an attack of the disease. Besides, tumefaction is not always distinct and not always perceptible, therefore, it cannot always be relied upon as a guide to operation. In acute, rapidly progressive cases, even if no pus can be discovered, an exploratory incision is justifiable. A fulminant peritonitis, due to ulceration and perforation of the appendix, calls for early operation, for delay here invites a fatal termination. In order that the operation may be successful here, it must be performed at the onset of urgent symptoms.

The results of early operation have been so favorable that so soon as a tumor, accompanied by the symptoms of suppuration, has formed, and it can be distinguished, it should be subjected to surgical treatment. Such eminent surgeons as McBurney, Bull, Weir, Abbe, Fitz, and Sims are in favor of early operation. It is claimed that early operation diminishes the risk of the extension of the inflammation, and the danger of rupture into the general peritoneal cavity. If a spreading and a threatened general peritonitis shall have been lighted up, then the major operation of laparotomy is indicated.

In his excellent paper,* read before the Practitioners' Society of New York City, Dr. R. F. Weir urged that, inas-

* New York Medical Journal, May 6, 1887.

much as the mortality is greater before the third day when a perityphlitic abscess has resulted from a perforative appendicitis, the pus, so soon as it was recognized, should be evacuated, extraperitoneal, if possible, or else by a lateral laparotomy with drainage of the cavity. He also states that if aspiration fails to detect pus whenever a tumor can be discovered, then an extraperitoneal incision should be made as for laparotomy.

Absence of urgent symptoms or their strict localization will, in my opinion, warrant a delay of varying length. Here within a reasonable time, after the beginning of the disease and after exploration shall have revealed the presence of pus, the abscess should be evacuated by aspiration or by incision, which must reach the pus whether it be extra- or intraperitoneal. It will not be out of place to narrate briefly, in this connection, the history of a case of perityphlitis which occurred in my practice, in which the abscess was evacuated by aspiration, the patient making a perfect recovery.

CASE.—Harry F., aged five years, was suddenly seized with severe pain in right iliac region. He was treated in the manner indicated in the earlier part of this paper. Within four days a slight swelling was discerned on the seat of pain. Dr. Varick, of Jersey City, was asked by the family to see the patient with me. The doctor agreed in the diagnosis of perityphlitis with possible abscess, and we decided to aspirate in order to verify our surmises. We succeeded in obtaining pus with the exploratory syringe. On the following day the patient was anæsthetized, and with a Dieulafoy instrument about four ounces of fetid pus was removed. Nothing worthy of note occurred from that time on to his ultimate recovery.

Collapse and hyperpyrexia are contraindications to operation. For obvious reasons no purgative whatever should be given before operation. Great abdominal distention should, if possible, be relieved before operating. After an attack shall have passed by, the greatest care is necessary to prevent a relapse. No purgatives should be given, the bowels being moved by enemata only. For a short while after recovery, restriction to liquid diet should be enforced. The patient should not be permitted to get up too soon. Recurrences of the attack, which are so lamentably frequent, can often be

prevented by regulation of diet, moderation in daily exercise, and securing regularity of stool. Tonics and stimulants should be administered to regulate the peristaltic action of the bowels and to improve the general health of the patient.

Children who have passed through an attack of this disease, and even those who frequently complain of abdominal pain, should always wear a tight bandage to keep the bowels from jolting. In conclusion, let me recapitulate in a formulated summary the treatment of the disease as suggested by our present knowledge of the subject.

First, in cases of a chronic or subacute perityphlitis, without a tumor or with a small tumor, the expectant plan of treatment may be followed.

Secondly, in cases of chronic or subacute perityphlitis, with a growing tumor with or without evidence of suppuration, extraperitoneal incision or aspiration should be done.

Thirdly, in cases of acute perityphlitis with threatening symptoms with tumor, and hyperacute cases without appreciable tumor, exploratory incision (extra- or intraperitoneal) should be made.

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